PHASE TWO
ENVIRONMENTAL SITE ASSESSMENT

of

192 Tanbark Road, Niagara on the Lake, ON

For:
St Davids Riverview Estates Inc.

December 15, 2021
Project: E-21-40-2

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PHASE TWO ENVIRONMENTAL SITE ASSESSMENT

of:

192 Tanbark Road, Niagara on the Lake, ON

Prepared by **Hallex Environmental Ltd**. on behalf of:

St Davids Riverview Estates Inc.

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Date: December 15, 2021

Project #: E-21-40-2

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EXECUTIVE SUMMARY

INTRODUCTION

Hallex Environmental Ltd. was retained by St David's Riverview Estates Inc., to conduct a Phase Two Environmental Site Assessment (ESA) at 192 Tanbark Road, Niagara on The Lake following the Phase One ESA completed by Hallex on July 22, 2021 that identified the following Potentially Contaminating Activities (PCA)/Areas of Potential Environmental Concern (APEC):

- ***PCA-1/APEC-1: Pesticides (including Herbicides, Fungicides and Anti-Fouling Agents) Manufacturing, Processing, Bulk Storage and Large-Scale Applications (#40 as per O. Reg.)*** – As identified in the aerial photographs the site historically was part of a fruit orchard. The application of herbicides to the trees can result in accumulated levels of contaminants within the soil. This historic land use represents an on-site APEC with target contaminants Organochlorine Pesticides (OCP), Lead and Arsenic.
- ***PCA-2/APEC-2: Gasoline and Associated Products Storage in Fixed Tanks (#28 as per O. Reg.) –*** Due to the age of the original residential dwelling there is a possibility of a heating oil tank having once been located at the site. Target contaminants include Petroleum Hydrocarbons (PHCs F1-F4), Benzene, Toluene, Ethylbenzene & Xylene (BTEX) and Polycyclic Aromatic Hydrocarbons (PAHs).

PHASE 2 ESA METHODS

Eight (8) test pits, TP-1-21 to TP-8-21 were advanced across the property (APEC areas) on October 21, 2021. Soil samples were collected at the interface of the topsoil and native soil generally from 0 to 0.76 meters below ground surface (mbgs) with the exception of the BTEX-PHC sample acquired 0 to 1.52 mbgs.

FINDINGS & CONCLUSIONS

The Phase Two Environmental Site Assessment at 192 Tanbark Road, revealed soil samples ***met*** applicable Ministry of the Environment, Conservation and Parks Site Condition Standards 2011 Table 2 for Residential Land Use in a Non-Potable Ground Water Situation, fine texture soil for target contaminants. Hallex considers the site suitable for development for residential purposes. No further Environmental Assessment work was considered necessary as of October 31, 2021.

LIST OF ACRONYMS

APEC	Area of Potential Environmental Concern
AST	Aboveground Storage Tank
BH	Borehole
BTEX	Benzene, Toluene, Ethylbenzene, Xylene
CO	Carbon Monoxide
CO_2	Carbon Dioxide
COC	Contaminant of Concern
CSM	Conceptual Site Model
CSVC	Combustible Soil Vapour Concentration
EC	Electrical Conductivity
EPA	Environmental Protection Act
ESA	Environmental Site Assessment
GPR	Ground Penetrating Radar
i	Hydraulic Gradient
k_h	Hydraulic Conductivity
LEL	Lower Explosive Limit
masl	Metres above sea level
mbgs	Metres below ground surface
MECP	Ministry of the Environment, Conservation and Parks
MW	Monitoring Well
OC/OCP	Organochlorine Pesticides
PAH	Polycyclic Aromatic Hydrocarbons
PCA	Potentially Contaminating Activity
PCB	Polychlorinated Biphenyl
PCE	Perchloroethylene (tetrachloroethylene)
pH	Power of Hydrogen
PHC	Petroleum Hydrocarbons
ppm	Parts per million
QA/QC	Quality Assurance/Quality Control
QP	Qualified Person
RA	Risk Assessment
RSC	Record of Site Condition
SAR	Specific Absorption Rate
SCS	Site Condition Standard
SGWSS	Soil Groundwater and Sediment Standards
SVOC	Semi-Volatile Organic Compounds
TCLP	Toxicity Classification Leachate Procedure
UST	Underground Storage Tank
VOC	Volatile Organic Compounds

Potentially Contaminating Activities (PCAs)
Schedule D Table 2 of O. Reg 511/09

PCA#	Description
1	Acid and Alkali Manufacturing, Processing and Bulk Storage
2	Adhesives and Resins Manufacturing, Processing and Bulk Storage
3	Airstrips and Hangars Operation
4	Antifreeze and De-icing Manufacturing and Bulk Storage
5	Asphalt and Bitumen Manufacturing
6	Battery Manufacturing, Recycling and Bulk Storage
7	Boat Manufacturing
8	Chemical Manufacturing, Processing and Bulk Storage
9	Coal Gasification
10	Commercial Autobody Shops
11	Commercial Trucking and Container Terminals
12	Concrete, Cement and Lime Manufacturing
13	Cosmetics Manufacturing, Processing and Bulk Storage
14	Crude Oil Refining, Processing and Bulk Storage
15	Discharge of Brine related to oil and gas production
16	Drum and Barrel and Tank Reconditioning and Recycling
17	Dye Manufacturing, Processing and Bulk Storage
18	Electricity Generation, Transformation and Power Stations
19	Electronic and Computer Equipment Manufacturing
20	Explosives and Ammunition Manufacturing, Production and Bulk Storage
21	Explosives and Firing Range
22	Fertilizer Manufacturing, Processing and Bulk Storage
23	Fire Retardant Manufacturing, Processing and Bulk Storage
24	Fire Training
25	Flocculants Manufacturing, Processing and Bulk Storage
26	Foam and Expanded Foam Manufacturing and Processing
27	Garages and Maintenance and Repair of Railcars, Marine Vehicles and Aviation Vehicles
28	Gasoline and Associated Products Storage in Fixed Tanks
29	Glass Manufacturing
30	Importation of Fill Material of Unknown Quality

PCA#	Description
31	Ink Manufacturing, Processing and Bulk Storage
32	Iron and Steel Manufacturing and Processing
33	Metal Treatment, Coating, Plating and Finishing
34	Metal Fabrication
35	Mining, Smelting and Refining; Ore Processing; Tailings Storage
36	Oil Production
37	Operation of Dry-Cleaning Equipment (where chemicals are used)
38	Ordnance Use
39	Paints Manufacturing, Processing and Bulk Storage
40	Pesticides (including Herbicides, Fungicides and Anti-Fouling Agents) Manufacturing, Processing, Bulk Storage and Large-Scale Applications
41	Petroleum-derived Gas Refining, Manufacturing, Processing and Bulk Storage
42	Pharmaceutical Manufacturing and Processing
43	Plastics (including Fibreglass) Manufacturing and Processing
44	Port Activities, including Operation and Maintenance of Wharves and Docks
45	Pulp, Paper and Paperboard Manufacturing and Processing
46	Rail Yards, Tracks and Spurs
47	Rubber Manufacturing and Processing
48	Salt Manufacturing, Processing and Bulk Storage
49	Salvage Yard, including automobile wrecking
50	Soap and Detergent Manufacturing, Processing and Bulk Storage
51	Solvent Manufacturing, Processing and Bulk Storage
52	Storage, maintenance, fueling and repair of equipment, vehicles, and material used to maintain transportation systems
53	Tannery
54	Textile Manufacturing and Processing
55	Transformer Manufacturing, Processing and Use
56	Treatment of Sewage equal to or greater than 10,000 litres per day
57	Vehicles and Associated Parts Manufacturing
58	Waste Disposal and Waste Management, including thermal treatment, landfilling and transfer of waste, other than use of biosoils as soil conditioners
59	Wood Treating and Preservative Facility and Bulk Storage of Treated and Preserved Wood Products

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1.0 INTRODUCTION

1.1 Project Objectives

Hallex Environmental Ltd. was retained by St Davids Riverview Estates Inc. (hereinafter referred to as the "client") to conduct a Phase Two Environmental Site Assessment (ESA) at 192 Tanbark Road, Niagara on the Lake, ON (hereinafter referred to as the "study site"). The objectives of the Phase Two ESA were to determine the presence/absence of potential contaminants of concern within the soil associated with possible historic pesticide use and potential historic heating oil, a Potentially Contaminating Activity (PCA) listed in Schedule D, Table 2, of O. Reg. 511/09, thus results in an Areas of Potential Environmental Concern (APEC) triggering the Phase Two ESA.

The presence of contaminants in the soil, if detected, would determine the need for further sampling and analyses to delineate the extent of the impact, and to satisfy the requirements of Ontario Regulation (O. Reg.) 153/04, as amended. The site location is shown on Figure 1 and the PCA/APEC, identified in the Phase One ESA (Hallex, 2021) are shown on Figure 2.

1.2 Limitations and Exceptions of Assessment

This report was prepared by Hallex Environmental Ltd. (hereinafter referred to as "Hallex") for the client. The material in it reflects Hallex's best judgment based on the information discovered at the time of preparation and within the scope of work. The investigative procedures, and format of this report, generally follow the guidelines established in: O. Reg. 511/09 per Part XV.1 of the Environmental Protection Act. Any information presented concerning materials at the site is based on information gathered at the Test Pit locations only. There may be materials and/or subsurface soil and/or groundwater conditions on-site which are not represented by these investigations. Any use which a third party makes of this report, or any reliance on or decisions to be made based on it, are the responsibility of such third parties. Hallex Environmental Ltd. accepts no responsibility for damages, if any, suffered by any third party as a result of decisions made or actions based on this report.

1.3 Site Description

Municipal address:	192 Tanbark Road, Niagara on the Lake, ON
Property Identifier Number (PIN)	46373-0062 (LT)
Client(s):	St. Davids Riverview Estates Inc.
UTM co-ordinates:	17T, 4779868.11m N 653773.13m E
Elevation:	124.8 masl
Approx. site area:	3,190m^2

1.4 Current and Proposed Future Uses

As of October 31, 2021, the study site is residential land use. A residential bungalow is located at the south east quadrant part of the site. Future plans for the site will be the demolition of the existing site structure

and regrading of the property for the redevelopment of the site for townhomes (freehold or condominiums not specified).

1.5 Applicable Site Condition Standard

The Soil, Ground Water and Sediment Standards (SGWSS) that would be applicable to the subject site as per O. Reg. 153/04, as amended, are based on site sensitivity analyses. Site sensitivity is determined based on conformance or non-conformance with shallow soil conditions (<2 m to bedrock), soil pH, proximity to an "Area of Natural Significance", the presence of a water body on-site or within 30 meters of the subject property, and the site and adjacent lands groundwater conditions being either potable or non-potable. The 'Full Depth Generic' standards would apply to a 'non-sensitive site', with further distinctions made based on potable or non-potable groundwater conditions, and coarse or fine soil texture. A 'Sensitive Site' would require application of generic standards, other than 'Full Depth', based on the specific sensitivity.

192 Tanbark Road– Site Sensitivity Analysis

The rationale for the selection of SGWSS criteria for the subject property included:

- Intended Property Use: **Residential**
- Soil Texture: **Fine (grain size texture by Paracel laboratories Ltd.)**
- Adjacent to a designated area of natural significance: **No**
- Within 30 m of a water body: **No**
- Groundwater condition: **Non-potable**
- Depth to bedrock: **Not encountered at maximum test pit depth of 1.5 metres.** Bedrock is at 25.14 mbgs, as per the well record #3801057, approximately 50m south of the study area.
- Soil pH: **7.58 average**, ranged from 7.53-7.63.

Applicable Regulatory Criteria

O. Reg. 153/04 Ministry of the Environment, Conservation and Parks (MECP) Site Condition Standards Table 2 for Residential Land Use in a Potable Ground Water Condition, fine textured soil, was applied to the subject site, based on conditions observed at the time of the site assessment.

1.6 Previous Environmental Reports

A Phase One Environmental Site Assessment report drafted by Hallex Environmental, July 22, 2021, was provided to Hallex Environmental Ltd. for review pertaining to the study site. Noted conclusions are summarized below:

- Two (2) on-site Potential Contaminating Activities that resulted in two (2) Areas of Potential Environmental Concern with the potential to have impacted the study site's soil.
    - ***PCA-1/APEC-1: Pesticides (including Herbicides, Fungicides and Anti-Fouling Agents) Manufacturing, Processing, Bulk Storage and Large-Scale Applications (#40 as per O. Reg.)*** – As identified in the aerial photographs the site historically was part of a fruit

orchard. The application of herbicides to the trees can result in accumulated levels of contaminants within the soil. This historic land use represents an on-site APEC with target contaminants Organochlorine Pesticides (OCP), Lead and Arsenic.

- ***PCA-2/APEC-2: Gasoline and Associated Products Storage in Fixed Tanks (#28 as per O. Reg.) –*** Due to the age of the original residential dwelling there is a possibility of a heating oil tank having once been located at the site. Target contaminants include Petroleum Hydrocarbons (PHCs F1-F4), Benzene, Toluene, Ethylbenzene & Xylene (BTEX) and Polycyclic Aromatic Hydrocarbons (PAHs).

- One (1) additional PCA was noted within 250 m of the Study Site, however it is unlikely that any contaminants migrating off-site would present an on-site APEC at the study site due to the distance to the site and interpreted groundwater flow direction away from the site.

RECOMMENDATIONS

Based on the above noted findings Hallex therefore recommends:

1) **A limited Phase Two Environmental Site Assessment to determine the presence/absence of potential contaminants of concern in the soil resulting from historic pesticide use and potential historic heating oil.**

2.0 INVESTIGATION METHODS

2.1 Test Pitting

A client supplied a low access excavator for the test pitting program. Preparation for test pits were initiated by the client who via requests for demarcation of underground utilities by Ontario One Call: for Bell, cable, hydro, natural gas, water, sewer and private locates. All services were cleared within the designated work areas.

2.2 Soil Investigation

Eight (8) test pits, TP-1-21 to TP-8-21 were advanced across the property (APEC areas) on October 21, 2021. Test Pit locations are shown in Figure 3 and Test Pit logs are contained in Appendix A. Soil samples were collected at the interface of the topsoil and native soil generally from 0 to 0.76 meters below ground surface (mbgs) with the exception of the BTEX-PHC sample acquired 0 to 1.52 mbgs.

2.2.1 Soil: Sampling

Each sample was placed in a 250 ml glass jar with a Teflon lined lid, filled to zero head-space, sealed, and placed in a cooler for transportation. For the BTEX-PHC sample, concurrently, a 12 ml soil sample was collected with a disposable syringe and placed inside a 40 ml vial containing methanol for field preservation of Petroleum Hydrocarbons F1, Benzene, Toluene, Ethylbenzene, Xylene (BTEX). A portion of each sample was placed in a plastic bag and allowed to warm to approximately 20^{o} C for headspace combustible vapour measurement using an MiniRAE DR200 photoionizing detector (PID). Each sample was logged for colour, texture, structure, moisture, and visual and olfactory evidence of contamination. Additionally, textural identification of soil, through hand soil textural techniques, including the 'squeeze test' and 'ribbon test' was conducted on soil from each stratum identified.

2.3 Field Screening Combustible Soil Vapour Survey

On-site field screening measurements were conducted utilizing the PID, capable of measuring volatile organic compounds (VOC ppm). The readings from the PID were utilized to indicate the presence or absence of VOC's within the field samples. The target strata were not selected via PID reading rather than that is where it will be found, PID readings were employed to screen for unusual spikes that may indicate the presence of other contaminates not addressed in the Phase One ESA report.

2.4 Quality Assurance and Quality Control Measures

Hallex conducted Quality Assurance/Quality Control (QA/QC) measures throughout all stages of the assessment to verify sampling procedures and results.

Decontamination of equipment and sampling tools was carried out during field work, as well as appropriate precautions, including new nitrile gloves, to minimize potential cross-contamination between samples and test pits.

Soil sampling was implemented according to *Protocol for Analytical Methods Used in the Assessment of Properties Under Part XV.1 of the Environmental Protection Act* (March 9, 2004 as amended as of July 1, 2011). Chain of Custody reports were completed for all samples submitted for analyses to keep track of samples collected and to ensure that all parties involved were properly informed as to the nature of the samples.

Instruments and all their associated components are checked daily prior to field use, and annual equipment servicing and maintenance is conducted by Enviro Measure Inc. to ensure the equipment remains properly calibrated and functioning.

3.0 REVIEW AND EVALUATION

3.1 Soil Conditions

Soil conditions were determined through field investigative measures including the use of analytical equipment, determination of stratigraphy including analysis of moisture, odours, colour, texture, etc. and combustible soil vapor concentration results.

Due to the nature of the investigation which is primary shallow test pits (for investigation of OCPs, lead and arsenic) and a single test pit to 1.52mbgs.

3.1.1 Overburden Stratigraphy

Due to the nature of the investigation which is primary shallow test pits (for investigation of OCPs, lead and arsenic) and a single test pit to 1.5mbgs, there is limited data for characterization beyond the interface of the topsoil and native material.

The general overburden stratigraphy observed in test pits TP-1-21 to TP-8-21 consisted of:

Depth (avg.)	Description
0 - 0.23 mbgs	Topsoil
0.23 – 1.52 mbgs	CLAYEY SILT to SILTY CLAY, brown, moist, low plasticity, slightly cohesive, loose to medium density.

Notes:

- Depth to bedrock: Not encountered at maximum test pit depth of 1.52 metres. Bedrock is at 25.14mbgs, as per the well record #3801057, approximately 50m south of the study area.
- Moisture was consistent throughout test pit depth.

3.2 Soil Vapour Concentrations

The field soil vapour concentrations are tabulated below, exhibiting a concentration range of 10 to 22 ppm (parts per million). Eight (8) samples were obtained for laboratory submission to Paracel Laboratories Ltd. under chain of custody # 2143472 on October 21, 2021 for analyses of OCPs, lead, arsenic, BTEX, PHC, pH, and Grain Size Texture.

Test Pit Number	#/ ID	Date Sampled	Depth (mbgs)	PID (ppm)	APEC-#	Parameters Analyzed
TP1-21	TP1-2	21-Oct-21	0.08-0.46	14	• PCA-1/APEC-1: Pesticides	OCPs, Lead & Arsenic
TP2-21	TP2-2	21-Oct-21	0.15-1.52	22	• PCA-2/APEC-2: Gasoline and Associated Products Storage in Fixed Tanks	BTEX-PHCS, PAHS
TP3-21	TP3-2	21-Oct-21	0.23-0.61	11.8	• PCA-1/APEC-1: Pesticides	OCPs, Lead & Arsenic

Test Pit Number	#/ ID	Date Sampled	Depth (mbgs)	PID (ppm)	APEC-#	Parameters Analyzed
TP4-21	TP4-2	21-Oct-21	0.23-0.76	15.1	• PCA-1/APEC-1: Pesticides	OCPs, Lead & Arsenic
TP5-21	TP5-2	21-Oct-21	0.23-0.61	12.4	• PCA-1/APEC-1: Pesticides	OCPs, Lead & Arsenic
TP6-21	TP6-2	21-Oct-21	0.23-0.61	21	• PCA-1/APEC-1: Pesticides	OCPs, Lead & Arsenic
TP7-21	TP7-2	21-Oct-21	0.23-0.76	10	• PCA-1/APEC-1: Pesticides	OCPs, Lead & Arsenic
TP8-21	TP8-2	21-Oct-21	0.23-0.76	10	• PCA-1/APEC-1: Pesticides	OCPs, Lead & Arsenic

Highlighted sample ID's above depict the samples chosen for submission to the lab.

3.3 Soil Laboratory Results

Soil laboratory analytical data was compared to MECP Site Condition Standards (2011) Table 2: Residential, Generic Site Condition Standards in a Potable soil Condition, fine textured soil. The results indicated that all samples ***met*** the criteria for the target contaminants analyzed. The soil laboratory analytical reports are provided in Appendix B.

3.4 Laboratory Quality Assurance and Quality Control

Laboratory QA/QC measures adhering to the Ministry of the Environment's "Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act, March 2010" are standard procedure for Paracel Laboratories (accredited to the ISO/IEC 17025 Standard by CALA) in order to ensure that the standards of quality were met within the expected level of confidence.

4.0 PHASE TWO CONCEPTUAL SITE MODEL

The Conceptual Site Model (CSM) qualitatively considers the interaction of identified contaminants of concern, and the pathway(s) and exposure route(s) to receptors. No target contaminants were identified within the soil medium with potential migration pathways to human and/or biota receptors as follows.

5.0 CONCLUSIONS

The Phase Two Environmental Site Assessment at 192 Tanbark Road, Niagara on the Lake, ON, revealed soil samples ***met*** applicable Ministry of the Environment, Conservation and Parks Site Condition Standards 2011 Table 2 for Residential Land Use in a Non-Potable Ground Water Situation, fine texture soil for target contaminants.

As of October 21th, 2021, no further environmental site assessment work is required and residential land use is justified.

6.0 AUTHOR

Hallex Environmental Ltd. has conducted this Phase Two Environmental Site Assessment as permitted by Hallex Certificate of Authorization (#90252). The following employees authored the report:

Craig Winston Muin'kakimik' Colbourne – Mr. Colbourne, A.Sc.T., was the environmental technologist for the project with over 20 years nationally and internationally in the Geo-Environmental sector with primary experiences to Phase II ESA and remedial work including geotechnical and hydrogeological investigations.

Nicole Metz - Ms. Nicole Metz, ETPD, ERPC, was the Project Coordinator for the project with over seven years of experience in the environmental consulting field. Some projects Mrs. Metz have worked on included: Phase One & Two Environmental Site Assessments, Site Remediation, groundwater and surface water sampling, underground or aboveground storage tank decommissioning, Designated Substance Surveys, Records of Site Condition Filing, Environmental Compliance Approvals, National Pollutant Release Inventory, and Hazardous Waste Information Network training.

Kevin Christian - Mr. Kevin Christian, M.Sc., P.Geo., a Professional Geoscientist (#0387) registered with the Association of Professional Geoscientists of Ontario, and a Qualified Person (Environmental Site Assessment & Risk Assessment) as per Ontario Regulations 153/04 and 511/09, has thirty years of experience in the environmental geoscience consulting industry conducting Phase One and Two ESA's, remedial planning, and site remediation supervision.

FIGURES

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HALLEX ENVIRONMENTAL LTD.

Legend

- Phase Two Property
- Residential Use
- Industrial Use
- Community Use
- Agricultural

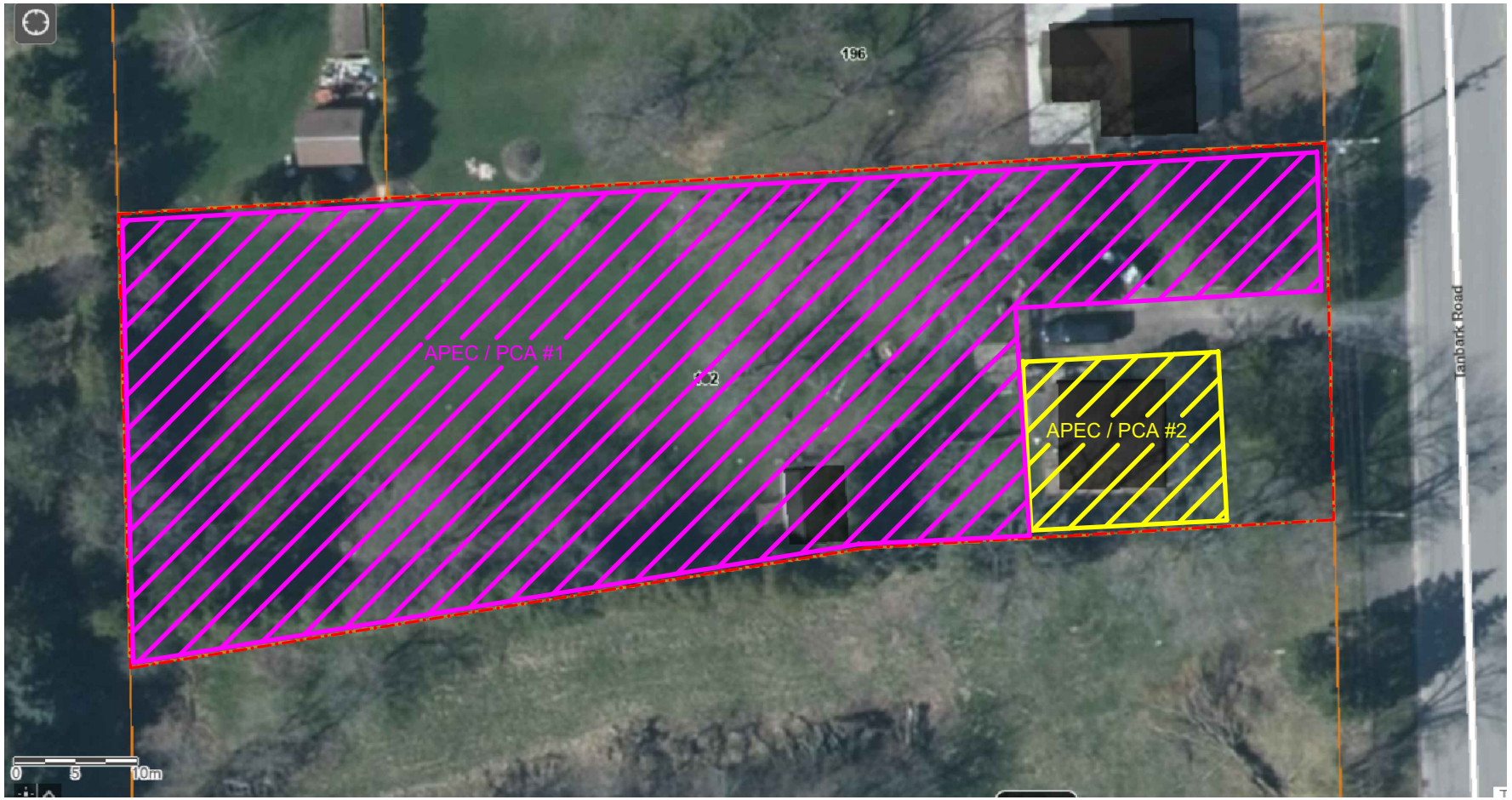
Client
St Davids Riverview Estates Inc.

Project
Phase Two ESA
192 Tanbark Road, Niagara on the Lake, ON

Figure Name
Site Location

Project	E-21-40-2
Date	October 2021
Drafted:	CC
Reviewed:	NM & KC

Figure 1



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Legend

- Phase Two Property
- APEC / PCA- #40 - Pesticides (including Herbicides, Fungicides and Anti-Fouling Agents) Manufacturing, Processing, Bulk Storage and Large-Scale Applications
- APEC / PCA- #28 Gasoline and Assoicated Products in Storage in Fixed Tanks

Client
St Davids Riverview Estates Inc.

Project
Phase Two ESA
192 Tanbark Road, Niagara on the Lake, ON

Figure Name
Areas of Potential Environmental Concern

Project	E-21-40-2
Date	October 2021
Drafted:	CC
Reviewed:	NM & KC

Figure 2

Scale as Shown

Legend

- Phase Two Property
- Test Pit Locations

Client
St Davids Riverview Estates Inc.

Project
Phase Two ESA
192 Tanbark Road, Niagara on the Lake, ON

Figure Name
Test Pit Locations.

Project	E-21-40-2
Date	October 2021
Drafted:	CC
Reviewed:	NM & KC

Figure 3

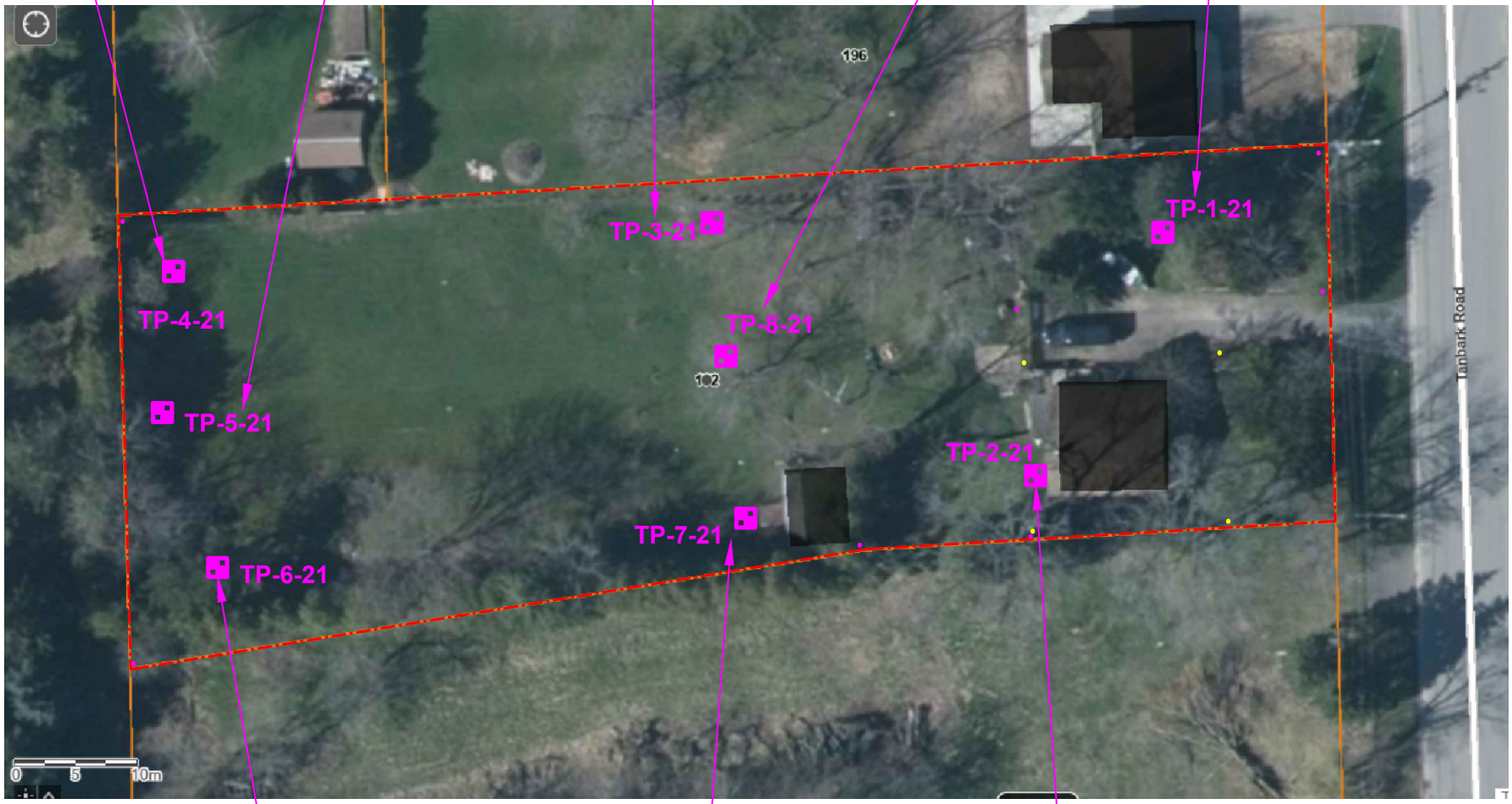
TEST PIT No.	SAMPLE ID	DEPTH	PARAMETERS TESTED
			OCPs
TP-4-21	TP-4-2	0. -0.76	X

TEST PIT No.	SAMPLE ID	DEPTH	PARAMETERS TESTED
			OCPs
TP-5-21	TP-5-2	0. -0.61	X

TEST PIT No.	SAMPLE ID	DEPTH	PARAMETERS TESTED
			OCPs
TP-3-21	TP-3-2	0. -0.61	X

TEST PIT No.	SAMPLE ID	DEPTH	PARAMETERS TESTED
			OCPs
TP-8-21	TP-8-2	0. -0.76	X

TEST PIT No.	SAMPLE ID	DEPTH	PARAMETERS TESTED	
			pH	OCPs
TP-1-21	TP-1-2	0. -0.46	X	X



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TEST PIT No.	SAMPLE ID	DEPTH	PARAMETERS TESTED
			OCPs
TP-7-2	0 -0.76		X

TEST PIT No.	SAMPLE ID	DEPTH	PARAMETERS TESTED
			OCPs
TP-6-21	TP-6-2	0. -0.61	X

TEST PIT No.	SAMPLE ID	DEPTH	PARAMETERS TESTED				
			PHCs & BTEX	PAHs	pH	OCPs	Grain Size (f or c)
TP-2-21	TP-2-2	0. -1.52	X	X	X	X	X

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Legend

- Phase Two Property
- Test Pit Locations

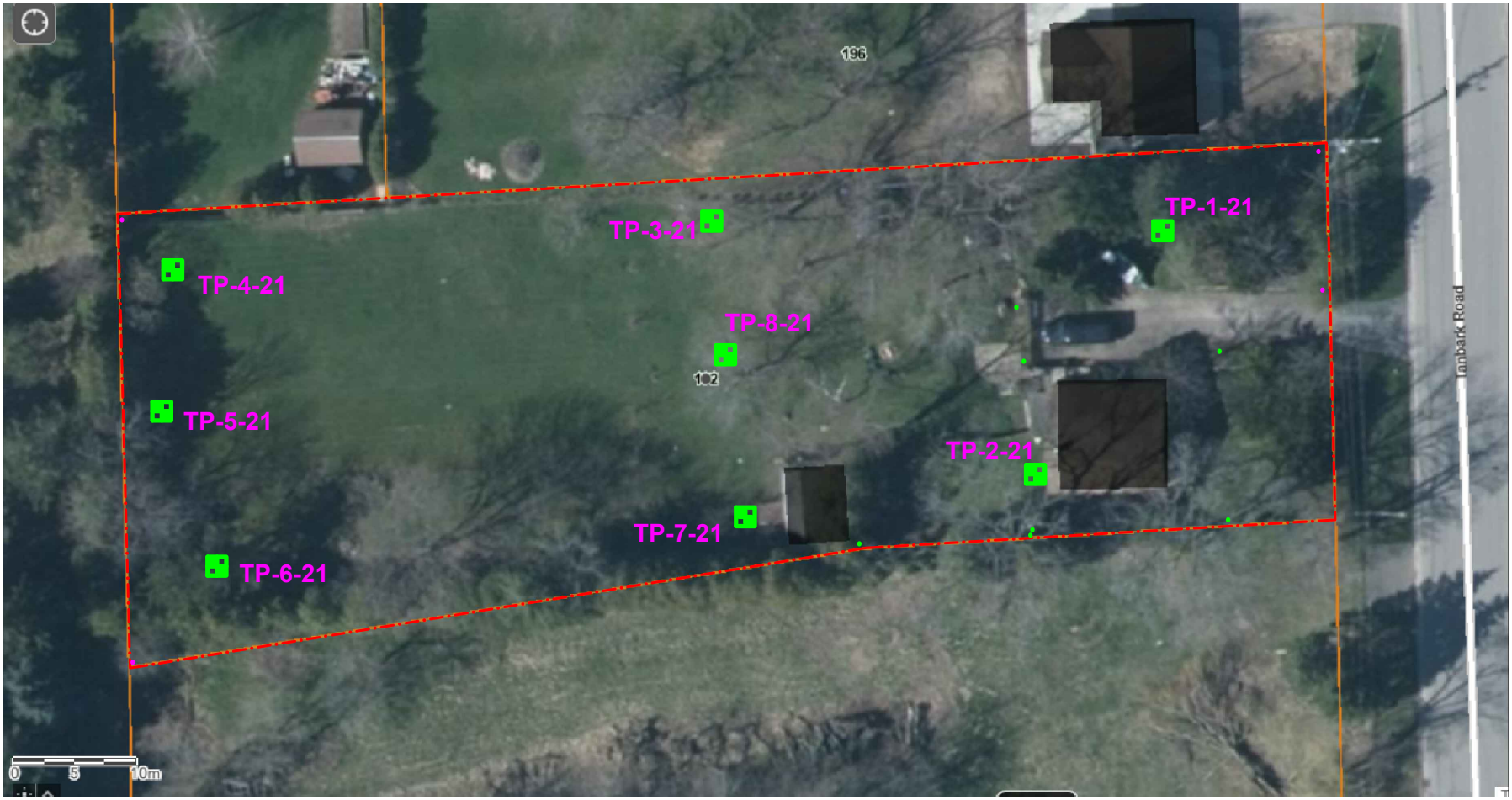
Client
St Davids Riverview Estates Inc.

Project
Phase Two ESA
192 Tanbark Road, Niagara on the Lake, ON

Figure Name
Soil Sample Summary Location / Intervals / Parameters.

Project	E-21-40-2
Date	October 2021
Drafted:	CC
Reviewed:	NM & KC

Figure 4



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For all investigated parameters (PHCs, BTEX, PAHs, lead, arsenic, OCPs, and pH)
No sample reported an exceedance over the set site standard of Table 2, Fine Textured Soils was reported.

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Legend

- Phase Two Property
- Test Pit Locations
- Exceedance of the Set Site Standard
- Meets the Set Site standard

Client
St Davids Riverview Estates Inc.

Project
Phase Two ESA
192 Tanbark Road, Niagara on the Lake, ON

Figure Name
Soil Results

Project E-21-40-2	Figure 5
Date October 2021	
Drafted: CC Reviewed: NM & KC	

Appendix A:

Field Logs

TEST PIT LOG **HALLEX ENVIRONMENTAL LTD**

Project No.: E-21-40-2					Client: St. Davids Riverview Estates Inc.	Location: 192 Tanbark Rd, NOTL	Date: October 21, 2021		
Test Pit #	**Interval**				**Description**		**Sample #**	**CSVC (ppm)**	**Parameters Tested**
	ft		m						
	Top	**Bottom**	**Top**	**Bottom**					
TP-1-21	0.00	0.25	0.00	0.08	FILL- Grass surface underlain byTOPSOIL, black to dark brown, moist, loose, organics and rootlets present				
	0.25	1.50	0.08	0.46	NATIVE - CLAYEY SILT TO SILTY CLAY, brown, moist, low plasticity, cohesive, loose to medium dense		TP-1-2 at Interface	14	Pesticides / Herbicides, pH
TP-2-21	0.00	0.50	0.00	0.15	FILL- Grass surface underlain byTOPSOIL, black to dark brown, moist, loose, organics and rootlets present				
	0.50	5.00	0.15	1.52	NATIVE - CLAYEY SILT TO SILTY CLAY, brown, moist, low plasticity, cohesive, loose to medium dense		TP-2-2 at Interface	22	BTEX-PHCs, PAHs, pH, Grain Size
TP-3-21	0.00	0.75	0.00	0.23	FILL- Grass surface underlain byTOPSOIL, black to dark brown, moist, loose, organics and rootlets present		.		
	0.75	2.00	0.23	0.61	NATIVE - CLAYEY SILT TO SILTY CLAY, brown, moist, low plasticity, cohesive, loose to medium dense		TP-3-2 at Interface	11.8	Pesticides / herbicides
TP-4-21	0.00	0.75	0.00	0.23	FILL- Grass surface underlain byTOPSOIL, black to dark brown, moist, loose, organics and rootlets present				
	0.75	2.50	0.23	0.76	NATIVE - CLAYEY SILT TO SILTY CLAY, brown, moist, low plasticity, cohesive, loose to medium dense		TP-4-2 at Interface	15.1	Pesticides / herbicides
TP-5-21	0.00	0.75	0.00	0.23	FILL- Grass surface underlain byTOPSOIL, black to dark brown, moist, loose, organics and rootlets present				
	0.75	2.00	0.23	0.61	NATIVE - CLAYEY SILT TO SILTY CLAY, brown, moist, low plasticity, cohesive, loose to medium dense		TP-5-2 at Interface	12.4	Pesticides / herbicides, pH

TEST PIT LOG **HALLEX ENVIRONMENTAL LTD**

Project No.: E-21-40-2	Client: St. Davids Riverview Estates Inc.	Location: 192 Tanbark Rd, NOTL	Date: October 21, 2021

Test Pit #	Interval				Description	Sample #	CSVC (ppm)	Parameters Tested
	ft		m					
	Top	Bottom	Top	Bottom				
TP-6-21	0.00	0.75	0.00	0.23	FILL- Grass surface underlain byTOPSOIL, black to dark brown, moist, loose, organics and rootlets present			
	0.75	2.00	0.23	0.61	NATIVE - CLAYEY SILT TO SILTY CLAY, brown, moist, low plasticity, cohesive, loose to medium dense	TP-6-2 at Interface	21	Pesticides / herbicides
TP-7-21	0.00	0.75	0.00	0.23	FILL- Grass surface underlain byTOPSOIL, black to dark brown, moist, loose, organics and rootlets present			
	0.75	2.50	0.23	0.76	NATIVE - CLAYEY SILT TO SILTY CLAY, brown, moist, low plasticity, cohesive, loose to medium dense	TP-7-2 at Interface	10	Pesticides / herbicides
TP-8-21	0.00	0.75	0.00	0.23	FILL- Grass surface underlain byTOPSOIL, black to dark brown, moist, loose, organics and rootlets present			
	0.75	2.50	0.23	0.76	NATIVE - CLAYEY SILT TO SILTY CLAY, brown, moist, low plasticity, cohesive, loose to medium dense	TP-8-2 at Interface	10	Pesticides / herbicides, pH

Appendix B:

Laboratory Analytical Reports

PARACEL LABORATORIES LTD.

TRUSTED.
RESPONSIVE.
RELIABLE.

351 Nash Road North, unit 9B
Hamilton, ON L8H 7P4
1-800-749-1947
www.paracellabs.com

Certificate of Analysis

Hallex Environmental Ltd.

4999 Victoria Ave
Niagara Falls, ON L2E 4C9
Attn: Kevin Christian

Client PO:
Project: E-21-40-2
Custody:

Report Date: 9-Dec-2021
Order Date: 21-Oct-2021

Revised Report

Order #: 2143472

This Certificate of Analysis contains analytical data applicable to the following samples as submitted:

Paracel ID	Client ID	Paracel ID	Client ID
2143472-01	TP-1-2		
2143472-02	TP-2-2		
2143472-03	TP-3-2		
2143472-04	TP-4-2		
2143472-05	TP-5-2		
2143472-06	TP-6-2		
2143472-07	TP-7-2		
2143472-08	TP-8-2		

Approved By:

Dale Robertson, BSc
Laboratory Director

Certificate of Analysis

Client: Hallex Environmental Ltd.

Client PO:

Report Date: 09-Dec-2021

Order Date: 21-Oct-2021

Project Description: E-21-40-2

Analysis Summary Table

Analysis	Method Reference/Description	Extraction Date	Analysis Date
BTEX by P&T GC-MS	EPA 8260 - P&T GC-MS	22-Oct-21	25-Oct-21
Metals, ICP-MS	EPA 6020 - Digestion - ICP-MS	8-Dec-21	8-Dec-21
pH, soil	EPA 150.1 - pH probe @ 25 °C, CaCl buffered ext.	22-Oct-21	22-Oct-21
PHC F1	CWS Tier 1 - P&T GC-FID	22-Oct-21	25-Oct-21
PHCs F2 to F4	CWS Tier 1 - GC-FID, extraction	25-Oct-21	26-Oct-21
REG 153: PAHs by GC-MS	EPA 8270 - GC-MS, extraction	26-Oct-21	27-Oct-21
REG 153: Pesticides, OC	EPA 8081B - GC-ECD	22-Oct-21	25-Oct-21
Solids, %	Gravimetric, calculation	22-Oct-21	22-Oct-21
Texture - Coarse Med/Fine	Based on ASTM D2487	25-Oct-21	25-Oct-21

Certificate of Analysis
Client: Hallex Environmental Ltd.
Client PO:

Report Date: 09-Dec-2021
Order Date: 21-Oct-2021
Project Description: E-21-40-2

Summary of Exceedances

(If this page is blank then there are no exceedances)

Only those criteria that a sample exceeds will be highlighted in red

Regulatory Comparison:

Paracel Laboratories has provided regulatory guidelines on this report for informational purposes only and makes no representations or warranties that the data is accurate or reflects the current regulatory values. The user is advised to consult with the appropriate official regulations to evaluate compliance. Sample results that are highlighted have exceeded the selected regulatory limit. Calculated uncertainty estimations have not been applied for determining regulatory exceedances. Regulatory limts displayed in brackets, (), applies to medium and fine textured soils.

Criteria:

Client ID	Analyte	MDL / Units	Result	Reg 153/04 (2011)-Table 7 Residential

PARACEL LABORATORIES LTD.

Order #: 2143472

Certificate of Analysis

Client: **Hallex Environmental Ltd.**

Client PO:

Report Date: 09-Dec-2021

Order Date: 21-Oct-2021

Project Description: E-21-40-2

	Client ID:	TP-1-2	TP-2-2	TP-3-2	TP-4-2	Criteria:	
	Sample Date:	21-Oct-2021	21-Oct-2021	21-Oct-2021	21-Oct-2021		
	Sample ID:	2143472-01	2143472-02	2143472-03	2143472-04	Reg 153/04 (2011)-Table 7 Residential	
	Matrix:	Soil	Soil	Soil	Soil		
	MDL/Units						
Physical Characteristics							
% Solids	0.1 % by Wt.	85.1	84.7	88.2	82.7		
>75 um	0.1 %	-	8.4	-	-		
<75 um	0.1 %	-	91.6	-	-		
Texture	0.1 %	-	Med/Fine	-	-		
General Inorganics							
pH	0.05 pH Units	7.53	7.63	-	-	(5 - 9)	pH units
Metals							
Arsenic	1 ug/g	6	6	4	4	(18)	ug/g
Lead	1 ug/g	18	7	13	9	(120)	ug/g
Volatiles							
Benzene	0.02 ug/g	-	<0.02	-	-	(0.17)	ug/g
Ethylbenzene	0.05 ug/g	-	<0.05	-	-	(15)	ug/g
Toluene	0.05 ug/g	-	<0.05	-	-	(6)	ug/g
m,p-Xylenes	0.05 ug/g	-	<0.05	-	-		
o-Xylene	0.05 ug/g	-	<0.05	-	-		
Xylenes, total	0.05 ug/g	-	<0.05	-	-	(25)	ug/g
Toluene-d8	Surrogate	-	103%	-	-		
Hydrocarbons							
F1 PHCs (C6-C10)	7 ug/g	-	<7	-	-	(65)	ug/g
F2 PHCs (C10-C16)	4 ug/g	-	<4	-	-	(150)	ug/g
F3 PHCs (C16-C34)	8 ug/g	-	<8	-	-	(1,300)	ug/g
F4 PHCs (C34-C50)	6 ug/g	-	<6	-	-	(5,600)	ug/g
Semi-Volatiles							

Certificate of Analysis

Client: **Hallex Environmental Ltd.**

Client PO:

Report Date: 09-Dec-2021

Order Date: 21-Oct-2021

Project Description: E-21-40-2

	Client ID:	TP-1-2	TP-2-2	TP-3-2	TP-4-2	**Criteria:**	
	Sample Date:	21-Oct-2021	21-Oct-2021	21-Oct-2021	21-Oct-2021		
	Sample ID:	2143472-01	2143472-02	2143472-03	2143472-04	**Reg 153/04 (2011)-Table 7 Residential**	
	Matrix:	Soil	Soil	Soil	Soil		
	MDL/Units						
Acenaphthene	0.02 ug/g	-	<0.02	-	-	(58)	ug/g
Acenaphthylene	0.02 ug/g	-	<0.02	-	-	(0.17)	ug/g
Anthracene	0.02 ug/g	-	<0.02	-	-	(0.74)	ug/g
Benzo [a] anthracene	0.02 ug/g	-	<0.02	-	-	(0.63)	ug/g
Benzo [a] pyrene	0.02 ug/g	-	<0.02	-	-	(0.3)	ug/g
Benzo [b] fluoranthene	0.02 ug/g	-	<0.02	-	-	(0.78)	ug/g
Benzo [g,h,i] perylene	0.02 ug/g	-	<0.02	-	-	(7.8)	ug/g
Benzo [k] fluoranthene	0.02 ug/g	-	<0.02	-	-	(0.78)	ug/g
Chrysene	0.02 ug/g	-	<0.02	-	-	(7.8)	ug/g
Dibenzo [a,h] anthracene	0.02 ug/g	-	<0.02	-	-	(0.1)	ug/g
Fluoranthene	0.02 ug/g	-	<0.02	-	-	(0.69)	ug/g
Fluorene	0.02 ug/g	-	<0.02	-	-	(69)	ug/g
Indeno [1,2,3-cd] pyrene	0.02 ug/g	-	<0.02	-	-	(0.48)	ug/g
1-Methylnaphthalene	0.02 ug/g	-	<0.02	-	-	(3.4)	ug/g
2-Methylnaphthalene	0.02 ug/g	-	<0.02	-	-	(3.4)	ug/g
Methylnaphthalene (1&2)	0.03 ug/g	-	<0.03	-	-	(3.4)	ug/g
Naphthalene	0.01 ug/g	-	<0.01	-	-	(0.75)	ug/g
Phenanthrene	0.02 ug/g	-	<0.02	-	-	(7.8)	ug/g
Pyrene	0.02 ug/g	-	<0.02	-	-	(78)	ug/g
2-Fluorobiphenyl	Surrogate	-	79.9%	-	-		
Terphenyl-d14	Surrogate	-	72.7%	-	-		
Pesticides, OC							
Aldrin	0.01 ug/g	<0.01	-	<0.01	<0.01	(0.05)	ug/g

Certificate of Analysis

Client: **Hallex Environmental Ltd.**

Client PO:

Report Date: 09-Dec-2021

Order Date: 21-Oct-2021

Project Description: E-21-40-2

	Client ID:	TP-1-2	TP-2-2	TP-3-2	TP-4-2	**Criteria:**	
	Sample Date:	21-Oct-2021	21-Oct-2021	21-Oct-2021	21-Oct-2021		
	Sample ID:	2143472-01	2143472-02	2143472-03	2143472-04	**Reg 153/04 (2011)-Table 7 Residential**	
	Matrix:	Soil	Soil	Soil	Soil		
	MDL/Units						
gamma-BHC (Lindane)	0.01 ug/g	<0.01	-	<0.01	<0.01	(0.063)	ug/g
alpha-Chlordane	0.01 ug/g	<0.01	-	<0.01	<0.01		
gamma-Chlordane	0.01 ug/g	<0.01	-	<0.01	<0.01		
Chlordane	0.01 ug/g	<0.01	-	<0.01	<0.01	(0.05)	ug/g
o,p'-DDD	0.01 ug/g	<0.01	-	<0.01	<0.01		
p,p'-DDD	0.02 ug/g	<0.02	-	<0.02	<0.02		
DDD	0.02 ug/g	<0.02	-	<0.02	<0.02	(3.3)	ug/g
o,p'-DDE	0.01 ug/g	<0.01	-	<0.01	<0.01		
p,p'-DDE	0.01 ug/g	<0.01	-	<0.01	<0.01		
DDE	0.01 ug/g	<0.01	-	<0.01	<0.01	(0.33)	ug/g
o,p'-DDT	0.01 ug/g	<0.01	-	<0.01	<0.01		
p,p'-DDT	0.01 ug/g	<0.01	-	<0.01	<0.01		
DDT	0.01 ug/g	<0.01	-	<0.01	<0.01	(1.4)	ug/g
Dieldrin	0.02 ug/g	<0.02	-	<0.02	<0.02	(0.05)	ug/g
Endrin	0.02 ug/g	<0.02	-	<0.02	<0.02	(0.04)	ug/g
Endosulfan I	0.01 ug/g	<0.01	-	<0.01	<0.01		
Endosulfan II	0.02 ug/g	<0.02	-	<0.02	<0.02		
Endosulfan I/II	0.02 ug/g	<0.02	-	<0.02	<0.02	(0.04)	ug/g
Heptachlor	0.01 ug/g	<0.01	-	<0.01	<0.01	(0.15)	ug/g
Heptachlor epoxide	0.01 ug/g	<0.01	-	<0.01	<0.01	(0.05)	ug/g
Hexachlorobenzene	0.01 ug/g	<0.01	-	<0.01	<0.01	(0.52)	ug/g
Hexachlorobutadiene	0.01 ug/g	<0.01	-	<0.01	<0.01	(0.014)	ug/g
Hexachloroethane	0.01 ug/g	<0.01	-	<0.01	<0.01	(0.071)	ug/g

Certificate of Analysis

Client: Hallex Environmental Ltd.

Client PO:

Report Date: 09-Dec-2021

Order Date: 21-Oct-2021

Project Description: E-21-40-2

	Client ID:	TP-1-2	TP-2-2	TP-3-2	TP-4-2	**Criteria:**	
	Sample Date:	21-Oct-2021	21-Oct-2021	21-Oct-2021	21-Oct-2021		
	Sample ID:	2143472-01	2143472-02	2143472-03	2143472-04	**Reg 153/04 (2011)-Table 7 Residential**	
	Matrix:	Soil	Soil	Soil	Soil		
	MDL/Units						
Methoxychlor	0.01 ug/g	<0.01	-	<0.01	<0.01	(0.13)	ug/g
Decachlorobiphenyl	Surrogate	87.0%	-	84.5%	83.4%		

Certificate of Analysis

Client: **Hallex Environmental Ltd.**

Client PO:

Report Date: 09-Dec-2021

Order Date: 21-Oct-2021

Project Description: E-21-40-2

	Client ID:	TP-5-2	TP-6-2	TP-7-2	TP-8-2	Criteria:	
	Sample Date:	21-Oct-2021	21-Oct-2021	21-Oct-2021	21-Oct-2021		
	Sample ID:	2143472-05	2143472-06	2143472-07	2143472-08	Reg 153/04 (2011)-Table 7 Residential	
	Matrix:	Soil	Soil	Soil	Soil		
	MDL/Units						
Physical Characteristics							
% Solids	0.1 % by Wt.	82.2	81.1	83.0	82.3		
General Inorganics							
pH	0.05 pH Units	6.26	-	-	7.36	(5 - 9)	pH units
Metals							
Arsenic	1 ug/g	4	6	5	5	(18)	ug/g
Lead	1 ug/g	8	10	64	12	(120)	ug/g
Pesticides, OC							
Aldrin	0.01 ug/g	<0.01	<0.01	<0.01	<0.01	(0.05)	ug/g
gamma-BHC (Lindane)	0.01 ug/g	<0.01	<0.01	<0.01	<0.01	(0.063)	ug/g
alpha-Chlordane	0.01 ug/g	<0.01	<0.01	<0.01	<0.01		
gamma-Chlordane	0.01 ug/g	<0.01	<0.01	<0.01	<0.01		
Chlordane	0.01 ug/g	<0.01	<0.01	<0.01	<0.01	(0.05)	ug/g
o,p'-DDD	0.01 ug/g	<0.01	<0.01	<0.01	<0.01		
p,p'-DDD	0.02 ug/g	<0.02	<0.02	<0.02	<0.02		
DDD	0.02 ug/g	<0.02	<0.02	<0.02	<0.02	(3.3)	ug/g
o,p'-DDE	0.01 ug/g	<0.01	<0.01	<0.01	<0.01		
p,p'-DDE	0.01 ug/g	<0.01	<0.01	<0.01	<0.01		
DDE	0.01 ug/g	<0.01	<0.01	<0.01	<0.01	(0.33)	ug/g
o,p'-DDT	0.01 ug/g	<0.01	<0.01	<0.01	<0.01		
p,p'-DDT	0.01 ug/g	<0.01	<0.01	<0.01	<0.01		
DDT	0.01 ug/g	<0.01	<0.01	<0.01	<0.01	(1.4)	ug/g
Dieldrin	0.02 ug/g	<0.02	<0.02	<0.02	<0.02	(0.05)	ug/g
Endrin	0.02 ug/g	<0.02	<0.02	<0.02	<0.02	(0.04)	ug/g

Certificate of Analysis

Client: Hallex Environmental Ltd.

Client PO:

Report Date: 09-Dec-2021

Order Date: 21-Oct-2021

Project Description: E-21-40-2

	Client ID:	TP-5-2	TP-6-2	TP-7-2	TP-8-2	**Criteria:**	
	Sample Date:	21-Oct-2021	21-Oct-2021	21-Oct-2021	21-Oct-2021		
	Sample ID:	2143472-05	2143472-06	2143472-07	2143472-08	**Reg 153/04 (2011)-Table 7 Residential**	
	Matrix:	Soil	Soil	Soil	Soil		
	MDL/Units						
Endosulfan I	0.01 ug/g	<0.01	<0.01	<0.01	<0.01		
Endosulfan II	0.02 ug/g	<0.02	<0.02	<0.02	<0.02		
Endosulfan I/II	0.02 ug/g	<0.02	<0.02	<0.02	<0.02	(0.04)	ug/g
Heptachlor	0.01 ug/g	<0.01	<0.01	<0.01	<0.01	(0.15)	ug/g
Heptachlor epoxide	0.01 ug/g	<0.01	<0.01	<0.01	<0.01	(0.05)	ug/g
Hexachlorobenzene	0.01 ug/g	<0.01	<0.01	<0.01	<0.01	(0.52)	ug/g
Hexachlorobutadiene	0.01 ug/g	<0.01	<0.01	<0.01	<0.01	(0.014)	ug/g
Hexachloroethane	0.01 ug/g	<0.01	<0.01	<0.01	<0.01	(0.071)	ug/g
Methoxychlor	0.01 ug/g	<0.01	<0.01	<0.01	<0.01	(0.13)	ug/g
Decachlorobiphenyl	Surrogate	71.7%	69.9%	74.9%	65.1%		

Method Quality Control: Blank

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Hydrocarbons									
F1 PHCs (C6-C10)	ND	7	ug/g						
F2 PHCs (C10-C16)	ND	4	ug/g						
F3 PHCs (C16-C34)	ND	8	ug/g						
F4 PHCs (C34-C50)	ND	6	ug/g						
Metals									
Arsenic	ND	1	ug/g						
Lead	ND	1	ug/g						
Pesticides, OC									
Aldrin	ND	0.01	ug/g						
gamma-BHC (Lindane)	ND	0.01	ug/g						
alpha-Chlordane	ND	0.01	ug/g						
gamma-Chlordane	ND	0.01	ug/g						
Chlordane	ND	0.01	ug/g						
o,p'-DDD	ND	0.01	ug/g						
p,p'-DDD	ND	0.02	ug/g						
DDD	ND	0.02	ug/g						
o,p'-DDE	ND	0.01	ug/g						
p,p'-DDE	ND	0.01	ug/g						
DDE	ND	0.01	ug/g						
o,p'-DDT	ND	0.01	ug/g						
p,p'-DDT	ND	0.01	ug/g						
DDT	ND	0.01	ug/g						
Dieldrin	ND	0.02	ug/g						
Endrin	ND	0.02	ug/g						
Endosulfan I	ND	0.01	ug/g						
Endosulfan II	ND	0.02	ug/g						
Endosulfan I/II	ND	0.02	ug/g						
Heptachlor	ND	0.01	ug/g						
Heptachlor epoxide	ND	0.01	ug/g						
Hexachlorobenzene	ND	0.01	ug/g						
Hexachlorobutadiene	ND	0.01	ug/g						
Hexachloroethane	ND	0.01	ug/g						
Methoxychlor	ND	0.01	ug/g						
Surrogate: Decachlorobiphenyl	*0.0480*		*ug/g*		*96.0*	*50-140*			
Semi-Volatiles									
Acenaphthene	ND	0.02	ug/g						
Acenaphthylene	ND	0.02	ug/g						
Anthracene	ND	0.02	ug/g						

Method Quality Control: Blank

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Benzo [a] anthracene	ND	0.02	ug/g						
Benzo [a] pyrene	ND	0.02	ug/g						
Benzo [b] fluoranthene	ND	0.02	ug/g						
Benzo [g,h,i] perylene	ND	0.02	ug/g						
Benzo [k] fluoranthene	ND	0.02	ug/g						
Chrysene	ND	0.02	ug/g						
Dibenzo [a,h] anthracene	ND	0.02	ug/g						
Fluoranthene	ND	0.02	ug/g						
Fluorene	ND	0.02	ug/g						
Indeno [1,2,3-cd] pyrene	ND	0.02	ug/g						
1-Methylnaphthalene	ND	0.02	ug/g						
2-Methylnaphthalene	ND	0.02	ug/g						
Methylnaphthalene (1&2)	ND	0.03	ug/g						
Naphthalene	ND	0.01	ug/g						
Phenanthrene	ND	0.02	ug/g						
Pyrene	ND	0.02	ug/g						
Surrogate: 2-Fluorobiphenyl	*0.135*		*ug/g*		*67.9*	*50-140*			
Surrogate: Terphenyl-d14	*0.208*		*ug/g*		*104*	*50-140*			
Volatiles									
Benzene	ND	0.02	ug/g						
Ethylbenzene	ND	0.05	ug/g						
Toluene	ND	0.05	ug/g						
m,p-Xylenes	ND	0.05	ug/g						
o-Xylene	ND	0.05	ug/g						
Xylenes, total	ND	0.05	ug/g						
Surrogate: Toluene-d8	*8.32*		*ug/g*		*104*	*50-140*			

Method Quality Control: Duplicate

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
General Inorganics									
pH	7.50	0.05	pH Units	7.53			0.4	2.3	
Hydrocarbons									
F1 PHCs (C6-C10)	ND	7	ug/g	ND			NC	40	
F2 PHCs (C10-C16)	ND	4	ug/g	ND			NC	30	
F3 PHCs (C16-C34)	ND	8	ug/g	10			NC	30	
F4 PHCs (C34-C50)	ND	6	ug/g	ND			NC	30	
Metals									
Arsenic	6.5	1	ug/g	6.5			0.6	30	
Lead	179	1	ug/g	189			5.6	30	
Pesticides, OC									
Aldrin	ND	0.01	ug/g	ND			NC	40	
gamma-BHC (Lindane)	ND	0.01	ug/g	ND			NC	40	
alpha-Chlordane	ND	0.01	ug/g	ND			NC	40	
gamma-Chlordane	ND	0.01	ug/g	ND			NC	40	
o,p'-DDD	ND	0.01	ug/g	ND			NC	40	
p,p'-DDD	ND	0.02	ug/g	ND			NC	40	
o,p'-DDE	ND	0.01	ug/g	ND			NC	40	
p,p'-DDE	ND	0.01	ug/g	ND			NC	40	
o,p'-DDT	ND	0.01	ug/g	ND			NC	40	
p,p'-DDT	ND	0.01	ug/g	ND			NC	40	
Dieldrin	ND	0.02	ug/g	ND			NC	40	
Endrin	ND	0.02	ug/g	ND			NC	40	
Endosulfan I	ND	0.01	ug/g	ND			NC	40	
Endosulfan II	ND	0.02	ug/g	ND			NC	40	
Heptachlor	ND	0.01	ug/g	ND			NC	40	
Heptachlor epoxide	ND	0.01	ug/g	ND			NC	40	
Hexachlorobenzene	ND	0.01	ug/g	ND			NC	40	
Hexachlorobutadiene	ND	0.01	ug/g	ND			NC	40	
Hexachloroethane	ND	0.01	ug/g	ND			NC	40	
Methoxychlor	ND	0.01	ug/g	ND			NC	40	
Surrogate: Decachlorobiphenyl	*0.0658*		ug/g		*116*	*50-140*			
Physical Characteristics									
% Solids	91.5	0.1	% by Wt.	91.0			0.6	25	
Semi-Volatiles									
Acenaphthene	ND	0.02	ug/g	ND			NC	40	
Acenaphthylene	ND	0.02	ug/g	ND			NC	40	

Method Quality Control: Duplicate

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Anthracene	ND	0.02	ug/g	ND			NC	40	
Benzo [a] anthracene	ND	0.02	ug/g	ND			NC	40	
Benzo [a] pyrene	ND	0.02	ug/g	ND			NC	40	
Benzo [b] fluoranthene	ND	0.02	ug/g	ND			NC	40	
Benzo [g,h,i] perylene	ND	0.02	ug/g	ND			NC	40	
Benzo [k] fluoranthene	ND	0.02	ug/g	ND			NC	40	
Chrysene	ND	0.02	ug/g	ND			NC	40	
Dibenzo [a,h] anthracene	ND	0.02	ug/g	ND			NC	40	
Fluoranthene	ND	0.02	ug/g	ND			NC	40	
Fluorene	ND	0.02	ug/g	ND			NC	40	
Indeno [1,2,3-cd] pyrene	ND	0.02	ug/g	ND			NC	40	
1-Methylnaphthalene	ND	0.02	ug/g	ND			NC	40	
2-Methylnaphthalene	ND	0.02	ug/g	ND			NC	40	
Naphthalene	ND	0.01	ug/g	ND			NC	40	
Phenanthrene	ND	0.02	ug/g	ND			NC	40	
Pyrene	ND	0.02	ug/g	ND			NC	40	
Surrogate: 2-Fluorobiphenyl	*0.178*		ug/g		*77.2*	*50-140*			
Surrogate: Terphenyl-d14	*0.241*		ug/g		*104*	*50-140*			
Volatiles									
Benzene	ND	0.02	ug/g	ND			NC	50	
Ethylbenzene	ND	0.05	ug/g	ND			NC	50	
Toluene	ND	0.05	ug/g	ND			NC	50	
m,p-Xylenes	ND	0.05	ug/g	ND			NC	50	
o-Xylene	ND	0.05	ug/g	ND			NC	50	
Surrogate: Toluene-d8	*7.00*		ug/g		*103*	*50-140*			

Method Quality Control: Spike

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Hydrocarbons									
F1 PHCs (C6-C10)	71	7	ug/g	ND	100	80-120			
F2 PHCs (C10-C16)	98	4	ug/g	ND	100	60-140			
F3 PHCs (C16-C34)	182	8	ug/g	10	78.0	60-140			
F4 PHCs (C34-C50)	151	6	ug/g	ND	94.8	60-140			
Metals									
Arsenic	50.7	1	ug/g	2.6	96.3	70-130			
Lead	119	1	ug/g	75.6	85.8	70-130			
Pesticides, OC									
Aldrin	0.21	0.01	ug/g	ND	94.0	50-140			
gamma-BHC (Lindane)	0.18	0.01	ug/g	ND	78.3	50-140			
alpha-Chlordane	0.19	0.01	ug/g	ND	83.2	50-140			
gamma-Chlordane	0.19	0.01	ug/g	ND	84.3	50-140			
o,p'-DDD	0.19	0.01	ug/g	ND	84.9	50-140			
p,p'-DDD	0.17	0.02	ug/g	ND	74.8	50-140			
o,p'-DDE	0.21	0.01	ug/g	ND	93.3	50-140			
p,p'-DDE	0.19	0.01	ug/g	ND	83.4	50-140			
o,p'-DDT	0.18	0.01	ug/g	ND	80.1	50-140			
p,p'-DDT	0.13	0.01	ug/g	ND	55.3	50-140			
Dieldrin	0.16	0.02	ug/g	ND	68.3	50-140			
Endosulfan I	0.23	0.01	ug/g	ND	103	50-140			
Endosulfan II	0.16	0.02	ug/g	ND	68.7	50-140			
Heptachlor	0.19	0.01	ug/g	ND	81.8	50-140			
Heptachlor epoxide	0.20	0.01	ug/g	ND	89.1	50-140			
Hexachlorobenzene	0.23	0.01	ug/g	ND	100	50-140			
Hexachlorobutadiene	0.22	0.01	ug/g	ND	95.5	50-140			
Hexachloroethane	0.20	0.01	ug/g	ND	86.8	50-140			
Methoxychlor	0.17	0.01	ug/g	ND	74.5	50-140			
Surrogate: Decachlorobiphenyl	*0.0482*		*ug/g*		*84.9*	*50-140*			
Semi-Volatiles									
Acenaphthene	0.116	0.02	ug/g	ND	100	50-140			
Acenaphthylene	0.123	0.02	ug/g	ND	107	50-140			
Anthracene	0.129	0.02	ug/g	ND	111	50-140			

Method Quality Control: Spike

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Benzo [a] anthracene	0.132	0.02	ug/g	ND	115	50-140			
Benzo [a] pyrene	0.158	0.02	ug/g	ND	137	50-140			
Benzo [b] fluoranthene	0.113	0.02	ug/g	ND	97.7	50-140			
Benzo [g,h,i] perylene	0.286	0.02	ug/g	ND	247	50-140			QM-05
Benzo [k] fluoranthene	0.098	0.02	ug/g	ND	84.5	50-140			
Chrysene	0.116	0.02	ug/g	ND	100	50-140			
Dibenzo [a,h] anthracene	0.373	0.02	ug/g	ND	323	50-140			QM-05
Fluoranthene	0.151	0.02	ug/g	ND	130	50-140			
Fluorene	0.142	0.02	ug/g	ND	123	50-140			
Indeno [1,2,3-cd] pyrene	0.299	0.02	ug/g	ND	258	50-140			QM-05
1-Methylnaphthalene	0.127	0.02	ug/g	ND	110	50-140			
2-Methylnaphthalene	0.117	0.02	ug/g	ND	101	50-140			
Naphthalene	0.111	0.01	ug/g	ND	95.9	50-140			
Phenanthrene	0.127	0.02	ug/g	ND	110	50-140			
Pyrene	0.104	0.02	ug/g	ND	89.6	50-140			
Surrogate: 2-Fluorobiphenyl	*0.186*		*ug/g*		*80.8*	*50-140*			
Surrogate: Terphenyl-d14	*0.173*		*ug/g*		*74.8*	*50-140*			
Volatiles									
Benzene	3.85	0.02	ug/g	ND	95.7	60-130			
Ethylbenzene	3.97	0.05	ug/g	ND	98.7	60-130			
Toluene	4.04	0.05	ug/g	ND	101	60-130			
m,p-Xylenes	7.80	0.05	ug/g	ND	97.3	60-130			
o-Xylene	3.88	0.05	ug/g	ND	96.5	60-130			
Surrogate: Toluene-d8	*7.83*		*ug/g*		*97.8*	*50-140*			

PARACEL LABORATORIES LTD.

Order #: 2143472

Certificate of Analysis

Report Date: 09-Dec-2021

Client: Hallex Environmental Ltd.

Order Date: 21-Oct-2021

Client PO:

Project Description: E-21-40-2

Qualifier Notes:

Sample Qualifiers :

QC Qualifiers :

QM-05 : The spike recovery was outside acceptance limits for the matrix spike due to matrix interference.

Sample Data Revisions

None

Work Order Revisions / Comments:

Revision-1 This report includes additional analysis as per client

Other Report Notes:

n/a: not applicable
ND: Not Detected
MDL: Method Detection Limit
Source Result: Data used as source for matrix and duplicate samples
%REC: Percent recovery.
RPD: Relative percent difference.
NC: Not Calculated

Soil/Solid results are reported on a dry weight basis unless otherwise indicated
Where %Solids is reported, moisture loss includes the loss of volatile hydrocarbons.

CCME PHC additional information:

- The method for the analysis of PHCs complies with the Reference Method for the CWS PHC and is validated for use in the laboratory. All prescribed quality criteria identified in the method has been met.
- F1 range corrected for BTEX.
- F2 to F3 ranges corrected for appropriate PAHs where available.
- The gravimetric heavy hydrocarbons (F4G) are not to be added to C6 to C50 hydrocarbons.
- In the case where F4 and F4G are both reported, the greater of the two results is to be used for comparison to CWS PHC criteria.
- When reported, data for F4G has been processed using a silica gel cleanup.

PARACEL LABORATORIES LTD.

Paracel ID: 2143472

Paracel Order Number (Lab Use Only)	Chain Of Custody (Lab Use Only)

Client Name: Hallex Environmental	Project Ref: E-21-40-2	Page 1 of 1
Contact Name: Kevin Christian	Quote #: 20-876	Turnaround Time
Address: 4999 Victoria Avenue, Niagara Falls, ON	PO #:	☐ 1 day ☐ 3 day
	E-mail: nmetz@hallex.ca & ccolbourne@hallex.ca	☐ 2 day ☒ Regular
Telephone: 905-988-8030	kchristian@hallex.ca	Date Required:

Regulation 153/04	Other Regulation
☐ Table 1 ☒ Res/Park ☒ Med/Fine	☐ REG 558 ☐ PWQO
☐ Table 2 ☐ Ind/Comm ☐ Coarse	☐ CCME ☐ MISA
☐ Table 3 ☐ Agri/Other	☐ SU - Sani ☐ SU - Storm
☒ Table 7	Mun:
For RSC: ☐ Yes ☒ No	☐ Other:

Matrix Type: S (Soil/Sed.) GW (Ground Water) SW (Surface Water) SS (Storm/Sanitary Sewer) P (Paint) A (Air) O (Other)

	Sample ID/Location Name	Matrix	Air Volume	# of Containers	Sample Taken Date	Sample Taken Time	PHCs F1-F4+BTEX	VOCs	PAHs	Metals by ICP	Hg	CrVI	B (HWS)	PHCs (F1-44)	pH	Grain Size (F or C)	OCP		
1	TP-1-2	S		1	OCT 21, 21	AM									✓		✓		
2	TP-2-2	S		3	OCT 21, 21	AM	✓		✓						✓	✓			
3	TP-3-2	S		1	OCT 21, 21	AM											✓		
4	TP-4-2	S		1	OCT 21, 21	AM											✓		
5	TP-5-2	S		1	OCT 21, 21	AM									✓		✓		
6	TP-6-2	S		1	OCT 21, 21	AM											✓		
7	TP-7-2	S		1	OCT 21, 21	AM											✓		
8	TP-8-2	S		1	OCT 21, 21	AM									✓		✓		
9																			
10																			

Comments:

Method of Delivery: Walk in

Relinquished By (Sign): Craig Colbourne	Received By Driver/Depot:	Received at Lab: Am	Verified By: BB
Relinquished By (Print): C. COLBOURNE	Date/Time:	Date/Time: 21/10/21 14:22	Date/Time: 21/10/21 15:00
Date/Time: Oct 21, 2021	Temperature: °C	Temperature: 17°C °C	pH Verified: ☐ By:

PARACEL LABORATORIES LTD.

Paracel ID: 2143472

Paracel Order Number (Lab Use Only)	Chain Of Custody (Lab Use Only)

Client Name: Hallex Environmental	Project Ref: E-21-40-2	Page 1 of 1
Contact Name: Kevin Christian	Quote #: 20-876	Turnaround Time
Address: 4999 Victoria Avenue, Niagara Falls, ON	PO #:	☐ 1 day ☐ 3 day
	E-mail: nmetz@hallex.ca & ccolbourne@hallex.ca	☐ 2 day ☒ Regular
Telephone: 905-988-8030	kchristian@hallex.ca	Date Required:

Regulation 153/04: ☐ Table 1 ☒ Res/Park ☒ Med/Fine ☐ Table 2 ☐ Ind/Comm ☐ Coarse ☐ Table 3 ☐ Agri/Other ☒ Table 7 — For RSC: ☐ Yes ☒ No

Other Regulation: ☐ REG 558 ☐ PWQO ☐ CCME ☐ MISA ☐ SU - Sani ☐ SU - Storm — Mun: ☐ Other:

Matrix Type: S (Soil/Sed.) GW (Ground Water) SW (Surface Water) SS (Storm/Sanitary Sewer) P (Paint) A (Air) O (Other)

	Sample ID/Location Name	Matrix	Air Volume	# of Containers	Sample Taken: Date	Sample Taken: Time	PHCs F1-F4+BTEX	VOCs	PAHs	Metals by ICP	Hg	CrVI	B (HWS)	PHCs (F1-44)	pH	Grain Size (F or C)	OCP		
1	TP-1-2	S		1	OCT 21, 21	AM									✓		✓		
2	TP-2-2	S		3	OCT 21, 21	AM	✓		✓						✓	✓			
3	TP-3-2	S		1	OCT 21, 21	AM									✓	✓			
4	TP-4-2	S		1	OCT 21, 21	AM											✓		
5	TP-5-2	S		1	OCT 21, 21	AM											✓		
6	TP-6-2	S		1	OCT 21, 21	AM									✓		✓		
7	TP-7-2	S		1	OCT 21, 21	AM											✓		
8	TP-8-2	S		1	OCT 21, 21	AM											✓		
9															✓		✓		
10																			

Comments:

Method of Delivery: Walk in

Relinquished By (Sign): Craig Colbourne (Digitally signed by Craig Colbourne, DN: cn=Craig Colbourne, c=CA, o=Hallex Environmental, email=ccolbourne@hallex.ca, Date: 2021.10.21 13:34:46 -04'00')	Received By Driver/Depot: [illegible]	Received at Lab: AM	Verified By: BB
Relinquished By (Print): C. COLBOURNE	Date/Time: Oct 22, 2021 10:10	Date/Time: 21/10/21 14:22	Date/Time: 21/10/21 15:00
Date/Time: Oct 21, 2021	Temperature: 2·8 °C	Temperature: 17°C	pH Verified: ☐ By: